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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/847,901	05/02/2001	Masajiro Inoue	SIW-008	7510

959 7590 10/06/2003

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EXAMINER	
ALEJANDRO, RAYMOND	
ART UNIT	PAPER NUMBER
1745	

DATE MAILED: 10/06/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/847,901	INOUE ET AL.	
	Examiner	Art Unit	
	Raymond Alejandro	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *04 September 2003* .

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-5* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-5* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☒ The proposed drawing correction filed on *04 September 2003* is: a)☒ approved b)☐ disapproved by the Examine

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) *6* .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other:

DETAILED ACTION

Response to Amendment

1. This communication is responsive to the amendment filed on 09/04/03. The applicants have overcome the objections and the 35 USC 112 rejections. Nevertheless, the double patenting rejection, the 35 USC 102 rejection and the 35 USC 103 rejection are herein maintained for the reasons of record.

Double Patenting

2. The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA 1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

3. Claims 1-2 and 5 are still provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-2 of copending Application No. 09/847895 (**Patent Application Publication US 2002/0031698**) as evidenced by Jones 6007933.

The copending Application No. 09/847895 claims the following (claims 1-2):

1. A fuel cell comprising:

a membrane electrode assembly having a solid polymer electrolyte membrane, an anode side diffusion electrode disposed at one side of the solid polymer electrolyte membrane, and a cathode side diffusion electrode disposed at the other side of the solid polymer electrolyte membrane;

a pair of separators which hold the membrane electrode assembly;

a projecting portion which extends from the solid polymer electrolyte membrane and which projects from the peripheries of the anode side diffusion electrode and the cathode side diffusion electrode; and

a seal, provided onto the separators, which was liquid sealant at the time of application, wherein

the seal makes contact with the projecting portion while the membrane electrode assembly is disposed between the separators.

2. A fuel cell according to claim 1, wherein the seal is provided in grooves formed in the separator.

As to the limitations of an anode side diffusion electrode comprising an anode electrode, and a first gas diffusion layer, and the cathode side diffusion electrode comprising a cathode electrode, and a second gas diffusion layer, it is noted that the copending Application No. 09/847895 inherently teaches such components because both the anode side diffusion electrode and the cathode side diffusion electrode (as instantly claimed in both co-pending applications) are understood to comprise respective anode electrode and its related gas diffusion element as well as respective cathode electrode and its related gas diffusion element. In this regard, it is noted that the claim language of copending Application No. 09/847895 reciting "an anode side diffusion electrode" and "a cathode side diffusion electrode" inherently encompasses that "the anode side diffusion electrode", at least, comprises an electrode portion and a gas diffusion portion as well as that "the cathode side diffusion electrode", at least, comprises another electrode portion and gas diffusion portion, too. However, in order to support the foregoing,

Jones 6007933 is further cited herein to evidence copending Application No. 09/847895 regarding this. Accordingly, Jones'933 (see col 6, lines 44-50 and col 6, line 56 to col 7, line 9) evidences copending Application No'895 in that respective anode and cathode side diffusion electrodes include: the anode and cathode sides, and anode and cathode gas diffusion layers, respectively, due to the intrinsic implication of the combined language reciting anode and cathode diffusion electrodes. Hence, those of ordinary skill in the art would recognize that anode and cathode side diffusion electrodes comprises the anode and cathode side per se and gas diffusion elements on each side.

It is also noted that, in this case, the claim limitations of the instant appplication'901 still appear to be broader or more generic than the claims of the copending application'895. Thus, the claims of the copending application'895 still anticipate the present claims. In re Goodman.

This is a provisional obviousness-type double patenting rejection.

Claim Rejections - 35 USC § 102

4. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

5. Claims 1-4 are rejected under 35 U.S.C. 102(b) as being anticipated by Jones 6007933.

The instant application is directed to a fuel cell wherein the disclosed inventive concept comprises the specific seal feature.

As to claim 1:

Jones discloses a fuel cell assembly including end plates and current collectors/conductor plates with a working section therebetween (col 5, lines 15-20); wherein working section

includes a number of layers (col 5, lines 25-26); preferably, a plurality of layers form one or more PEM-type fuel cells (col 5, lines 35-38). PEM represents a proton exchange membrane or polymer Electrolyte membrane, the PEM is a solid polymer electrolyte (col 1, lines 26-38). Figure 3 shows fluid flow plates serving as flow field plates in a fuel cell.

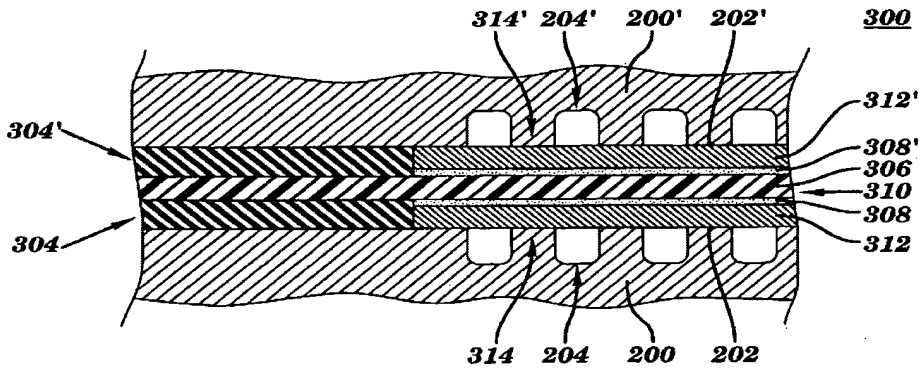


FIG. 3

As seen in Figure 3, fuel cell 300 includes the membrane electrode assembly (MEA) 310 comprising a solid polymer electrolyte 306, catalyst 308 and 308' which facilitate chemical reaction are applied to the anode and cathode sides, respectively of the solid polymer electrolyte. This unit can be referred to as a membrane electrode assembly (col 6, line 56 to col 7, line 4). The MEA is sandwiched between anode and cathode gas diffusion layers 312 and 312', respectively (col 7, lines 5-8).

For purposes of illustration, Figure 3 also depicts the fuel cell with fluid flow plates 200 and 200' serving as flow field plates *(it is noted that separator plates are sometimes referred to as flow field plates, that is, separator plates are also conventionally known in the art as flow field plate)*, in particular, flow field plate 200 might serve as an anode side of the fuel cell, and flow field plate 200' might serve as a cathode side of the fuel cell. That is, face 202 might comprise an anode face, and face 202' might comprise a cathode face (col 6, lines 44-50).

Jones discloses that gasketing material or gaskets 304, 304' can be employed to seal peripheral holes. A given gasket might take the form of, for instance, a frame gasket made from polytetrafluoroethylene material (col 6, lines 34-42). As depicted in Figure 3, the gasketing material 304, 304' contacts the end faces of both gas diffusion layers 312 and 312'.

With respect to gasketing material or gasket, it is noted that a gasket is a material or a member used to make a joint fluid tight. Accordingly, gasketing material is a sealing agent which provides a tight closure to prevent the passage or return of fluids so as to close or male secure against access, leakage or passage. Thus, the gasketing material or gasket is interpreted to serve as a seal provided on the flow field plates.

****NOTE:** With respect to the limitation that the seal was *liquid sealant at the time of application*, it is noted that applicants disclose the liquid sealant *hardens* into solid sealant while maintaining certain degree of elasticity even after the seal has been formed; and that the liquid sealant is made of a thermosetting fluorine-containing (***refer to page 11, third full paragraph of applicants' specification***). In that, it is noted that the recitation *a seal, provided onto the separators, which was liquid sealant at the time of application* is interpreted as a solid seal per se because such limitation refers to the *initial state* of the *liquid* sealant at the time of application, but the *final state* (the working seal) of the seal is *solid* as the liquid sealant hardens into solid sealant; accordingly, it is noted that Jones' teaching encompasses the solid seal formed to contact the fuel cell components. Thus, Jones' frame gasket made from polytetrafluoroethylene material (fluorine-container polymer) is a solid sealing material employed to provide a tight closure or seal in the fuel cell.**

With respect to claim 2:

As illustrated in Figure 3, the edge of solid polymer membrane 306 extends beyond (extended/projecting portion) the end faces of the anode and cathode side; and the gasketing material 304, 304' contacts the extended portion of the solid polymer electrolyte.

Regarding claim 3:

As depicted in Figure 3, the gasketing material 304, 304' contacts the end faces of both gas diffusion layers 312 and 312'.

With respect to claim 4:

As shown in Figure 3, the gasketing material 304, 304' contacts the end faces of both gas diffusion layers 312-catalyst 308 and gas diffusion layers 312'-catalyst 308' which are considered to be the anode and cathode electrode sides, respectively.

Thus, the claims are anticipated.

Claim Rejections - 35 USC § 103

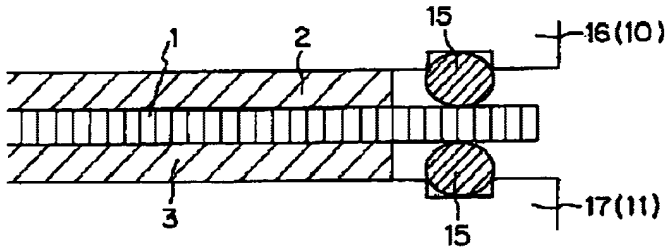
6. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

7. Claim 5 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jones 6007933 as applied to claim 1 above, and further in view of Japanese publication JP 08-148169.

Jones is applied, argued and incorporated herein for the reasons above. However, Jones does not disclose the seal provided in grooves formed in the separator.

The JP'169 publication illustrates in Figure 2 a fuel cell structure including gas diffusion electrode wherein the separators 16, 17 provide grooves which are contacted and sealed by O-ring seals 15 (Figure 2 and section 0008).

【図２】



In view of the above, it would have been obvious to one skilled in the art at the time the invention was made to seal Jones' separators by providing grooves thereon (*seal provided in grooves in the separator to seal them*) so as to obtain a seal-groove sealing structure as taught by the JP'169 publication as the JP'169 publication teaches that when plates or frames (separators) constitute the main enclosing member of the fuel cell structure, an O-ring seal disposed between grooves formed in the separator enhances and ensures the adhesion of both separators. Further, the O-ring-grooves sealing feature provides a sealing technique having the advantage of employing adhesive forces without damaging fuel cell elements. Thus, this provides a sealing feature that ensures a sufficient sealing effect only through light pressing of the polymeric electrolyte film of fuel cell, and preventing damages to the electrolyte film per se. *The teaching of JP'169 is also consistent with another embodiment of Jones teaching and encompassing the employment of O-ring gaskets.*

Response to Arguments

Applicant's arguments filed on 09/04/03 have been fully considered but they are not persuasive. The main contention of applicants' argument is premised on the assertion that the prior art of record does not teach or suggest a fuel cell having electrodes that are separate from a gas diffusion layer, and closer to a membrane. However, this assertion is respectfully disagreed with. In this regard, it is noted that the primary reference does, in fact, clearly teach or show in ***FIGURE 3*** above a fuel cell 300 including a membrane electrode assembly (MEA) 310 comprising a solid polymer electrolyte 306, catalysts 308 and 308' which facilitate chemical reaction and sandwiched between the anode and cathode gas diffusion layers 312 and 312', respectively. In that, it is pointed out that catalyst electrode materials 308 and 308' are separate layers themselves and are located closer to the solid polymer electrolyte membrane than respective gas diffusion layers. It is also noted that fuel cell electrodes are conventionally composed of the catalyst layer itself which facilitate chemical reaction and the gas diffusion layer to diffuse the reacting gas. It appears the applicants are confusing the fluid flow plates 200 and 200' and their respective faces 202 and 202' acting as the anode side and the cathode side of the fuel cell as the particular anode catalytic electrode and cathode catalytic electrode. In general, the side wherein fuel reactant flows in or is introduced into is known as the anode side, whereas the side wherein oxidant reactant flows in or is introduced into is known as the cathode side. That is why the '933 patent is making reference to both the anode side and the cathode side of the fuel cell so as to provide structural orientation of the fuel cell components. However, the specific site where the electrochemical reaction takes place is in the membrane electrode assembly per se including the catalyst feature necessary to carry out such reaction. Hence, in

view of the specific embodiment orientation and structural arrangement of the fuel cell components of the primary reference, the present claims remain anticipated.

As to "the seal which was liquid sealant at the time of application", the examiner wishes to indicate that applicants disclose the liquid sealant *hardens* into solid sealant while maintaining certain degree of elasticity even after the seal has been formed; and that the liquid sealant is made of a thermosetting fluorine-containing (***refer to page 11, third full paragraph of applicants' specification***). In that, it is noted that the recitation "a seal, provided onto the separators, which was liquid sealant at the time of application" is being interpreted as *any solid seal per se* because such limitation refers to the initial state of the liquid sealant at the time of application, but the final state, *the working seal*, of the seal is solid as the liquid sealant hardens into solid sealant; accordingly, it is noted that Jones' teaching encompasses the solid seal formed to contact the fuel cell components. Thus, Jones' frame gasket made from the specified fluorine-containing polymer is a solid sealing feature employed to provide a tight closure or seal in the fuel cell.

Furthermore, applicants argue that the seal is formed of a certain material having selected properties and capabilities; a type of material used to form the seal i.e. a material such as, a thermosetting fluorine-containing material or thermosetting silicon (see amendment, page 7, last full paragraph and page 8, first paragraph). However, the present claims are silent to both the specific material and its property or characteristic. Succinctly stated, the arguments provided by the applicants are not commensurate to the presently-claimed invention.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Raymond Alejandro whose telephone number is (703) 306-3326. The examiner can normally be reached on Monday-Thursday (8:30 am - 7:00 pm).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's primary examiner, Steve Kalafut can be reached on (703) 308-0433. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9310 for regular communications and (703) 872-9311 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

STEPHEN KALAFUT
PRIMARY EXAMINER
GROUP 1700